

# INFLUENCE OF TEMPERATURE ON THE OPERATION OF THE SUPERCONDUCTING FAULT CURRENT LIMITER FOR MEDIUM VOLTAGE NETWORKS

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**ABSTRACT** *The superconducting fault current limiter (SFCL) for medium voltage networks cooled using a cryocooler was financed by NFOŚiGW and NCBiR, under the project: GEKON2 / O2 / 267193/13/2015, and was tested in the Electrotechnical Institute. The 2nd generation high temperature superconductor (HTS) tape – SF12100 was used to build this SFCL. In this limiter it is possible to change the operating temperature. The limiter operation was analyzed at three temperatures: 72 K, 80 K and 86 K, in which the experimental short-circuit tests were made and at lower temperatures: 38 K, 51 K, 66 K, and at liquid nitrogen temperature: 77,4 K. The operating current can be increased many times by lowering the limiter's operating temperature. For initial temperatures above 51 K, the maximum temperature of the superconducting tapes when the short-circuit current is switched off by an external switch ( $t = 0,08$  s) does not exceed 290 K. For temperatures above 51 K, the current limitation time can be increased. Extending the limiter's operating time will increase the maximum HTS tape temperature and extend the limiter's cooling time after limiting the short-circuit.*

**Keywords:** *superconducting fault current limiter, SFCL, 2nd generation high temperature superconductor tape, HTS*